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Alberta
OCCUPATIONAL HEALTH AND SAFETY

REPORT

LOST-TIME INJURIES AND ILLNESSES UPSTREAM OIL AND GAS INDUSTRIES

ALBERTA, 1982 - 1991

INTRODUCTION

This report contains information about all time-loss injuries in the Upstream Oil and Gas Industries which were reported to and accepted by the Workers' Compensation Board of Alberta. Data from Saskatchewan and British Columbia appear in tables A4, A5, and A6.

Not all oil and gas related industries appear in this report. In the past, Alberta oil and gas industry totals included the tar sands, and oilfield maintenance and construction, and excluded oil refineries and pipelines. This definition has been retained so that totals published here are consistent with those published elsewhere.

This report has been prepared in response to recommendations contained in the Report (1988) of the Upstream Petroleum Industry Task Force on Safety (UPITFOS), and made by the "Accident Statistics Working Group" established to implement recommendations number 5,6, and 7 of the Report .

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December 1992

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A. UPSTREAM OIL AND GAS INDUSTRY

1. *Upstream Oil and Gas Industries in Alberta*

All of the oil and gas industries have shown improvements since 1988. The lost-time claim rate totals for Alberta show that the risk of injury has declined steadily since 1985 (Figure A1).

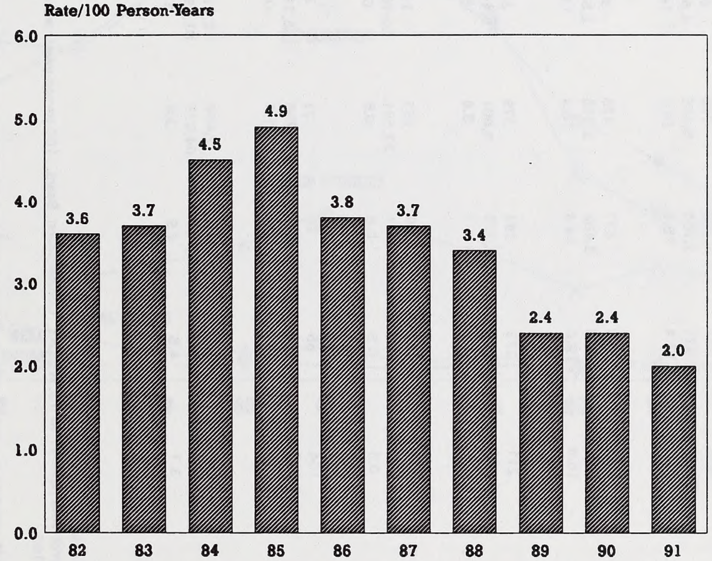

Figure A1: Lost-time claim rates in the Oil and Gas industy in Alberta from 1982 to 1991.

Source: AOHS Annual Rate Report, 1982-1991; Research & Information Development

INDUSTRY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Exploration										
Lost-Time Claims[1]	324	373	401	443	246	344	412	292	279	205
Estimated Person-Years[2]	3,162	3,221	2,966	3,153	1,908	1,828	2,186	1,706	1,554	1,586
Lost-Time Claim Rate[3]	10.2	11.6	13.5	14.0	12.8	18.8	18.8	17.1	17.9	12.9
Drilling										
Lost-Time Claims	753	615	844	1,190	732	690	621	241	205	165
Estimated Person-Years	6,487	5,428	6,321	7,756	5,055	4,640	4,979	3,405	3,686	3,307
Lost-Time Claim Rate	11.6	11.3	13.4	15.3	14.5	14.9	12.5	7.1	5.6	5.0
Service Rigs										
Lost-Time Claims	385	391	538	677	476	352	321	201	192	142
Estimated Person-Years	2,466	2,504	2,838	3,483	2,515	2,519	2,657	2,277	2,563	2,491
Lost-Time Claim Rate	15.6	15.6	19.0	19.4	18.9	14.0	12.1	8.9	7.5	5.7
Other Field Services										
Lost-Time Claims	347	211	273	394	379	322	311	223	265	248
Estimated Person-Years	6,793	6,082	6,818	8,376	6,601	6,401	7,259	7,132	6,857	7,378
Lost-Time Claim Rate	5.1	3.5	4.0	4.7	5.8	5.0	4.3	3.1	3.9	3.4
Well Operations										
Lost-Time Claims	118	143	153	189	153	136	169	126	115	127
Estimated Person-Years	36,643	31,747	30,032	33,457	33,581	30,460	33,696	30,668	30,037	29,672
Lost-Time Claim Rate	0.3	0.5	0.5	0.6	0.5	0.4	0.5	0.4	0.4	0.4
Gas Plants[4]										
Lost-Time Claims	128	104	55	75	71	41	56	39	42	26
Estimated Person-Years	6,489	6,737	6,870	7,484	6,756	6,394	7,148	6,022	6,601	6,743
Lost-Time Claim Rate	2.0	1.5	0.8	1.0	1.1	0.6	0.8	0.6	0.6	0.4
Total Oil & Gas[5]										
Lost-Time Claims	2,647	2,344	2,846	3,553	2,488	2,271	2,294	1,496	1,463	1,238
Estimated Person-Years	72,751	63,262	63,452	72,751	64,938	61,291	67,698	61,175	61,669	61,104
Lost-Time Claim Rate	3.6	3.7	4.5	4.9	3.8	3.7	3.4	2.4	2.4	2.0

Notes:

1 Lost-time claims result in absence from work beyond one day of the injury.
2 Number of person-years is estimated from wage and payroll data reported to the Workers' Compensation Board. 100 person-years are equivalent to 200,000 exposure hours.
3 Claim rate: (lost-time claims/estimated person-years) x 100.
4 Includes sulphur processing
5 Total of all oil and gas field activities e.g. tar sands, oilfield maintenance and construction.

Table A1: Estimated person years, lost time claims, and claim rates for the upstream oil and gas industries in Alberta, 1982 - 1991.

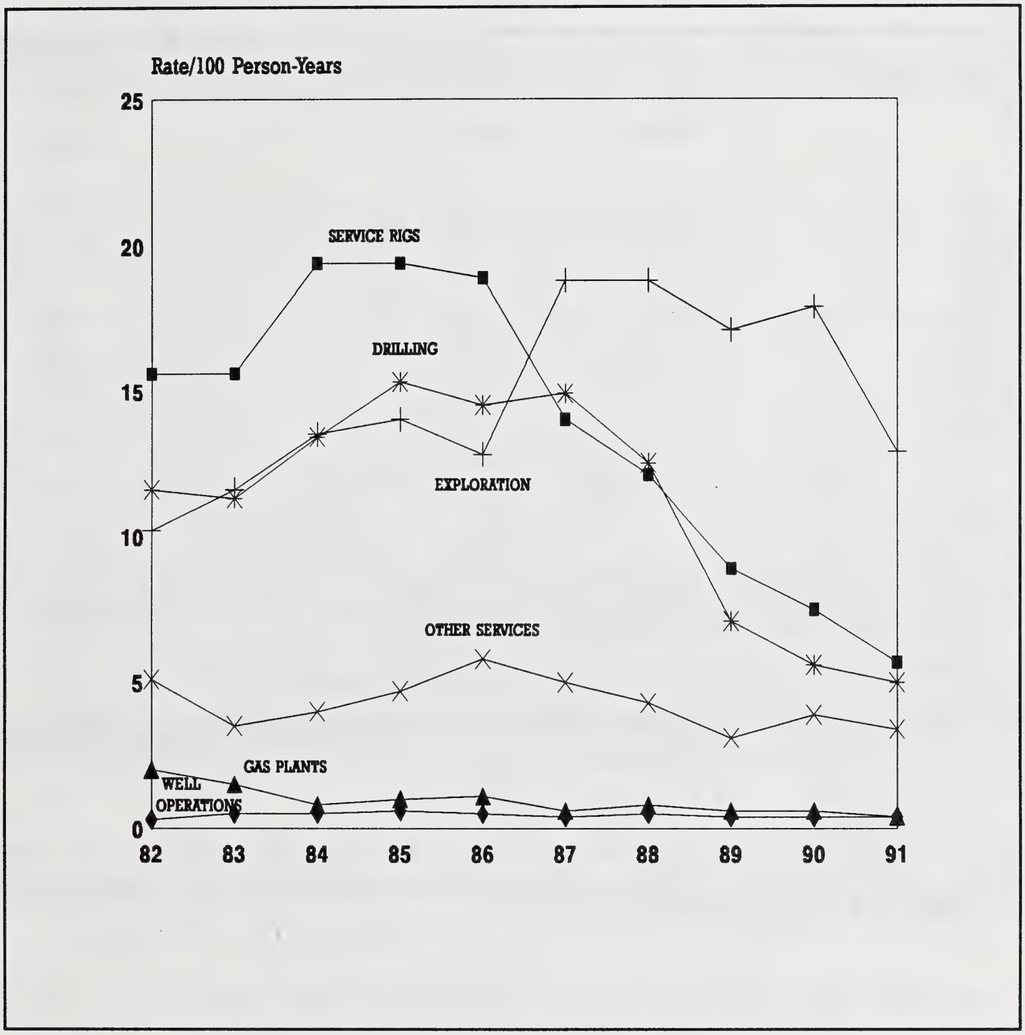

Figure A2: Lost-time claim rates for the upstream oil and gas industry in Alberta, 1982-1991

As can be seen from Table A1 and Figure A2, there have been notable improvements in most industries within recent years. The most notable improvement is a 67% decrease in the lost-time claim rate within the drilling sector between 1985 and 1991.

Source: AOHS Annual Rate Report, Research and Information Development

2 *Occupational Fatalities In The Oil And Gas Industries Accepted By The Workers' Compensation Board of Alberta, 1982 - 1991.*

YEAR ACCEPTED	**FATALITIES ACCEPTED BY ALBERTA WCB**[1,2]			
	Worksite	***Highway***	***Disease***	***TOTAL***
1982	14	9	2	25
1983	6	5	1	12
1984	6	0	0	6
1985	12	6	3	21
1986	8	6	1	15
1987	8	4	2	14
1988	14	7	0	21
1989	3	2	0	5
1990	3	11	0	14
1991	7	1	1	9
TOTAL	**81 (57.0%)**	**51 (35.9%)**	**10 (7.0%)**	**142**

Notes:

1. Fatalities are included based upon the year in which the occupational fatality was accepted by the WCB. The fatal incident could have occurred in prior years. Likewise, some fatal incidents occurring in these years may only become "accepted fatalities" in future years.

2. Fatalities included in this table are only for the industries listed in Appendix B.

Tables A2: Occupational fatalities in the Alberta oil and gas industries which were accepted by the Workers' Compensation Board between 1982 and 1991.

There have been 142 fatalities in the upstream oil and gas industry since 1982. Most occurred at the worksite (57.0%). There are brief descriptions of worksite fatalities investigated by AOHS in Appendix A.

Source: Alberta WCB, and Alberta Occupational Health and Safety.

3 Upstream Oil and Gas Industries In British Columbia.

There has been a decline in the total lost-time claim rate for the oil and gas industries in British Columbia since 1987. There were fewer claims in 1987 than in 1991, but there is a lower claim rate in 1991 because of the higher number of person-years. The drilling and service rig industries have had the most dramatic decreases in lost-time claim rates.

LOST-TIME CLAIM RATES

INDUSTRY	**1987**	**1988**	**1989**	**1990**	**1991**
Operations, production	1.6	1.3	2.1	1.7	1.6
Geo-seismic	12.1	10.8	8.7	9.2	9.1
Drilling	13.7	9.5	6.7	7.9	5.1
Service rigs	8.8	6.4	6.7	6.0	1.4
Other services	7.3	7.0	6.9	6.8	4.1
Estimated Person-Years	1,632	2,132	2,448	2,706	3,052
Lost-Time Claims	102	124	138	173	128
LTC Rate	6.3	5.8	5.6	6.4	4.2

Note: Due to differences in industry definition, industry activity mix, WCB reporting and acceptance practices, and employment estimation methods between provinces, caution should be used when comparing data.

Table A3: Lost-time claim rates in the British Columbia oil and gas industry from 1987 to 1991.

Source: British Columbia WCB.

As with British Columbia, the total lost-time claim rate for the Saskatchewan oil and gas industry has declined since 1987. Specifically, the most notable improvement was in the service rigs sector where the claim rate dropped from 20.7 in 1987 to 8.6 in 1991. The drilling industry also showed a large claim rate decrease from 17.4 in 1987 to 4.5 in 1991.

LOST-TIME CLAIM RATES

INDUSTRY	**1987**	**1988**	**1989**	**1990**	**1991**
Operations, production	1.9	1.3	1.0	1.6	0.8
Geo-seismic	19.4	15.2	13.1	16.3	10.1
Drilling	17.4	16.8	6.8	5.6	4.5
Service rigs	20.7	16.8	11.4	9.7	8.6
Other services	6.8	5.8	5.1	4.2	5.0
Estimated Person-Years	3,226	4,016	3,362	3,680	3,976
Lost-Time Claims	288	312	169	195	180
LTC Rate	8.9	7.8	5.0	5.3	4.5

Note: Due to differences in industry definition, industry activity mix, WCB reporting and acceptance practices, and employment estimation methods between provinces, caution should be used when comparing data.

Table A4: Lost-time claim rates for the Saskatchewan oil and gas industries from 1987 to 1991.

Source: Saskatchewan WCB.

5 Upstream Oil And Gas Industries In Alberta

The Alberta oil and gas industry has also shown a steady decline in the lost-time claim rate. Alberta shows the same improvements as Saskatchewan and British Columbia in the drilling and service rig industries. The lost-time claim rate decreased 66% in the drilling sector, and 63% in the service rigs sector between 1987 and 1991.

LOST-TIME CLAIM RATES

INDUSTRY	**1987**	**1988**	**1989**	**1990**	**1991**
Operations, production	0.4	0.5	0.4	0.4	0.4
Geo-seismic	18.8	18.8	17.1	17.9	12.9
Drilling	14.9	12.5	7.1	5.6	5.0
Service Rigs	14.0	12.1	8.9	7.5	5.7
Other Services	5.0	4.3	3.1	3.9	3.4
TOTAL*					
Estimated Person-Years	45,848	50,777	45,188	44,647	44,434
Lost-Time Claims	1,844	1,834	1,083	1,057	887
LTC Rate	4.0	3.6	2.4	2.4	2.0

* The Alberta Total in this table includes only the industries listed in this table. This total has been created specially for comparability with B.C. and Saskatchewan, and cannot be compared with the totals in Table A3.

Note: Due to differences in industry definition, industry activity mix, WCB reporting and acceptance practices, and employment estimation methods between provinces, caution should be used when comparing data.

Table A5: Lost-time claim rates on the Alberta oil and gas industry from 1987 to 1991.

Source: Alberta Occupational Health and Safety.

6 Western Canada Claim Rates For The Oil And Gas Industry.

There has been a decrease in the risk of injury throughout Western Canada in recent years, and as we can see from table A6, and figure A3, 1991 has had the lowest claim rate over the past five years in the oil and gas industry.

LOST-TIME CLAIM RATES

YEAR	LTC	PERSON-YEARS	RATE
1987	2,234	50,706	4.4
1988	2,270	56,925	4.0
1989	1,390	50,998	2.7
1990	1,425	51,033	2.8
1991	1,195	51,462	2.3

Table A6: Lost-time claim rates for Western Canada oil and gas industries from 1987 to 1991.

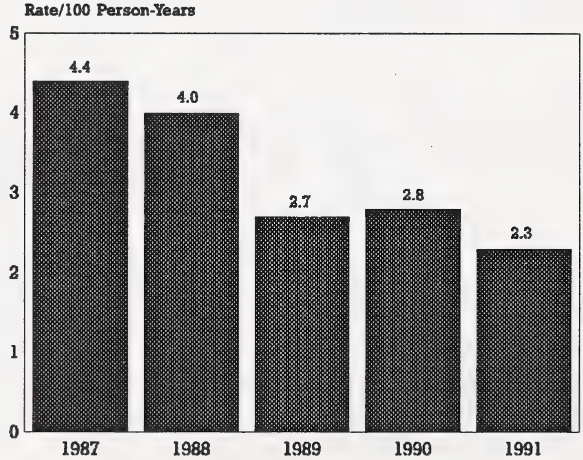

Figure A3: Lost-time claims by days lost in the oil and gas industry, Western Canada, 1987 to 1991.

Note: A lost-time claim results in loss of work beyond the day of accident.

Source: British Columbia WCB; Saskatchewan WCB; Alberta Occupational Health and Safety.

B. SEISMIC EXPLORATION AND SHOT HOLE DRILLING

1 *Estimated lost-time claim rates*

Injury rates in this industry sector are currently the highest of the upstream oil and gas industries. The number of lost-time claims have decreased since 1987. The severity rate has also decreased since 1987, and is estimated at 549 days lost per 100 person-years for 1991.

ESTIMATED LOST-TIME CLAIM RATES

	1987	**1988**	**1989**	**1990**	**1991**
Seismic Exploration and Shot Hole Drilling: 9200, 9201					
Lost-Time Claims[1]	344	412	292	279	205
Estimated Person-Years	1,828	2,186	1,706	1,554	1,586
Industry Average Claim Rate[2]	18.8	18.8	17.1	17.9	12.9
Severity Rate[3]	673	707	720	765	549
Total Oil & Gas Industry					
Lost-Time Claims	2,271	2,294	1,496	1,463	1,238
Estimated Person-Years	61,291	67,698	61,175	61,669	61,104
Industry Average Claim Rate	3.7	3.4	2.4	2.4	2.0
All Alberta Industries					
Lost-Time Claims	40,489	42,858	42,342	43,470	37,688
Estimated Person-Years	784,466	833,264	855,747	874,525	860,352
Industry Average Claim Rate	5.2	5.1	4.9	5.0	4.4

Notes:

1 A lost-time claim results in loss of work beyond the day of the accident.
2 Claim rate = (Lost-time claims ÷ person-years) x 100.
3 Severity Rate = (Compensation Days Paid x 100) ÷ Person-Years.

Compensation days paid by WCB are accumulated through to March 31 of the following year; days paid after this date are not included in the calculation. No allowance is made for fatalities.

Table B1: Estimated lost-time claim rates for seismic exploration and shot-hole drilling Alberta, 1987 to 1991.

Source: Alberta Occupational Health and Safety Annual Injury Rate Report, 1987 - 1991.

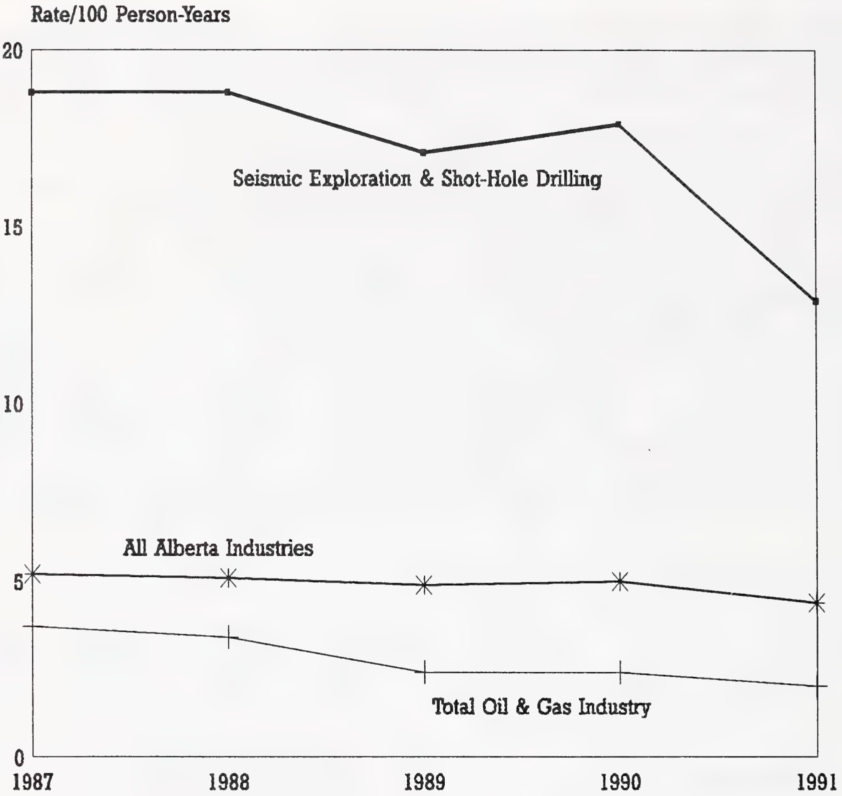

Figure B1: Estimated lost-time claim rates in the seismic exploration and shot-hole drilling industry in Alberta.

Source: AOHS Annual Rate Report, 1982-1991; Research & Information Development

2 *Lost-time claims by source of injury and accident type*

LOST-TIME CLAIMS BY SOURCE OF INJURY

Source of Injury	**# Claims**	**% Claims**
Vehicles	347	22.9
Working surfaces	300	19.8
Bodily Motion	219	14.4
Metal items	94	6.2
Electric apparatus	77	5.1
Unpowered handtools	65	4.3
Plants, trees	57	3.8
Boxes, containers	39	2.6
Other, unknown	318	21.0
TOTAL	1,516	100.0

Table B2: *Lost time claims by the source of injury in Alberta's seismic exploration and shot hole drilling industry from 1987 to 1991.*

The major source of injury was vehicles (23%),and the most common type of accidents were vehicle accidents (16%).

LOST-TIME CLAIMS BY TYPE OF ACCIDENT

Type of Accident	**# Claims**	**% Claims**
Overexertion	235	15.5
Vehicle accidents	249	16.4
Fall from elevation	204	13.5
Bodily reaction	219	14.4
Fall on same level	198	13.1
Struck by object	122	8.0
Caught in, under, between	96	6.3
Struck against object	80	5.3
Temperature extremes	44	2.9
Other	69	4.6
TOTAL	1,516	100.0

Table B3: *Lost time claims by accident type in the seismic exploration and shot hole drilling industry from 1987 to 1991.*

Note: A lost time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 - 1991.

3 *Lost-time Claims By Nature Of Injury And Part Of Body Injured.*

LOST-TIME CLAIMS BY NATURE OF INJURY

Nature of Injury	**# Claims**	**% Claims**
Sprain, strain	706	46.6
Bruise, crushing	215	14.2
Multiple injury	208	13.7
Dislocation, fracture	117	7.7
Cut, laceration	71	4.7
Inflammation of joints, tendons	71	4.7
Other disease	51	3.4
Other	77	5.0
TOTAL	1,516	100.0

Table B4: *Lost-time claims by nature of injury in the seismic exploration and shot-hole drilling in Alberta from 1987 to 1991.*

47% of claims involved sprains or strains, 14% involved bruises or crushing. The back was the most frequent part of body injured (20%) followed by the leg (15%), and the ankle or foot (14%).

LOST-TIME CLAIMS BY PART OF BODY INJURED

Part of Body Injured	**# Claims**	**% Claims**
Back	309	20.4
Multiple parts	230	15.2
Leg	228	15.0
Ankle, foot	208	13.7
Other trunk	166	10.9
Wrist, hand	110	7.3
Fingers	84	5.5
Face, head, neck	67	4.4
Arm	46	3.0
Eyes	30	2.0
Other	38	2.5
TOTAL	1,516	100.0

Table B5: *Lost-time claims by part of body injured in seismic exploration and shot-hole drilling industry in Alberta from 1987 to 1991.*

Note: A lost time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 - 1991.

4 *Lost-time Claims By Age And Length Of Time Employed*

LOST-TIME CLAIMS BY AGE

Age of Claimant	**# Claims**	**% Claims**
15 - 24 years	802	52.9
25 - 34 years	571	37.7
35 - 44 years	101	6.7
45 - 54 years	31	2.0
55+ years	8	0.5
Unknown	3	0.2
TOTAL	1,516	100.0

Table B6: *Lost-time claims by age of claimant in seismic exploration and shot-hole drilling in Alberta from 1987 to 1991.*

At the time of injury the majority of claimants were less than 25 years old (53%). Most had been with their current employer less than six months (68.7%).

LOST-TIME CLAIMS BY LENGTH OF TIME EMPLOYED

Length of Time Employed	**# Claims**	**% Claims**
Less than 1 month	617	40.7
1 - 6 months	424	28.0
6 months - 1 year	92	6.1
Greater than 1 year	155	10.2
Unknown	228	15.0
TOTAL	1,516	100.0

Table B7: *Lost-time claims by length of time employed in seismic exploration and shot-hole drilling in Alberta from 1987 to 1991.*

Note: A lost-time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 - 1991.

5 *Lost-time Claims By Days Lost.*

LOST-TIME CLAIMS BY DAYS LOST

Days Lost	**# Claims**	**% Claims**
1 - 5 days	258	17.0
6 - 10 days	290	19.1
11 - 15 days	188	12.4
16 - 20 days	115	7.6
21 - 30 days	152	10.0
31 - 40 days	92	6.1
41 - 50 days	66	4.4
50+ days	318	21.0
Unknown	37	2.4
TOTAL	1,516	100.0

Table B8: *Number of days lost in the seismic exploration and shot-hole drilling industry in Alberta from 1987 to 1991.*

21% of injuries from 1987 to 1991 resulted in more than 50 days of lost work. 17% resulted in one to five days of lost work.

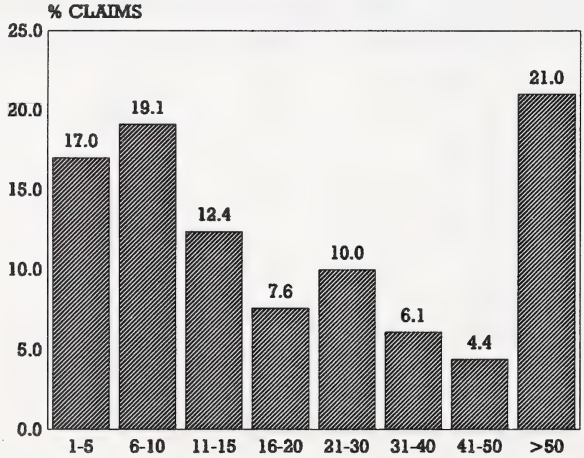

Figure B2: Lost-time claims by days lost in the seismic exploration and shot-hole drilling industry in Alberta, 1987-1991.

Note: A lost time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 - 1991.

C. DRILLING OF OIL AND GAS WELLS

1. Estimated Lost-Time Claim Rates

Injury rates have decreased since 1987 in this industry. The claim rate has fallen 66%, and the severity rate has also declined steadily during this time period.

ESTIMATED LOST-TIME CLAIM RATES

	1987	1988	1989	1990	1991
Drilling of Oil and Gas Wells: 9600					
Lost-Time Claims[1]	690	621	241	204	165
Estimated Person-Years	4,640	4,976	3,405	3,686	3,307
Industry Average Claim Rate[2]	14.9	12.5	7.1	5.5	5.0
Severity Rate[3]	913	846	584	512	443
Total Oil & Gas Industry					
Lost-Time Claims	2,271	2,294	1,496	1,463	1,238
Estimated Person-Years	61,291	67,698	61,175	61,669	61,104
Industry Average Claim Rate	3.7	3.4	2.4	2.4	2.0
All Alberta Industries					
Lost-Time Claims	40,489	42,858	42,342	43,470	37,688
Estimated Person-Years	784,466	833,264	855,747	874,525	860,352
Industry Average Claim Rate	5.2	5.1	4.9	5.0	4.4

Notes:

1 Lost-time claims result in loss of work beyond the day of the accident.

2 Claim rate = (lost-time claims/person years) x 100

3 Severity Rate = (compensation days paid x 100) ÷ person years

Compensation days paid by WCB are accumulated through to March 31 of the following year; days paid after this date are not included in the calculation. No allowance is made for fatalities.

Table C1: Estimated lost-time claim rates for the drilling of oil and gas wells in Alberta from 1987 to 1991.

Source: Alberta Occupational Health and Safety Annual Injury Rate Report, 1987 to 1991.

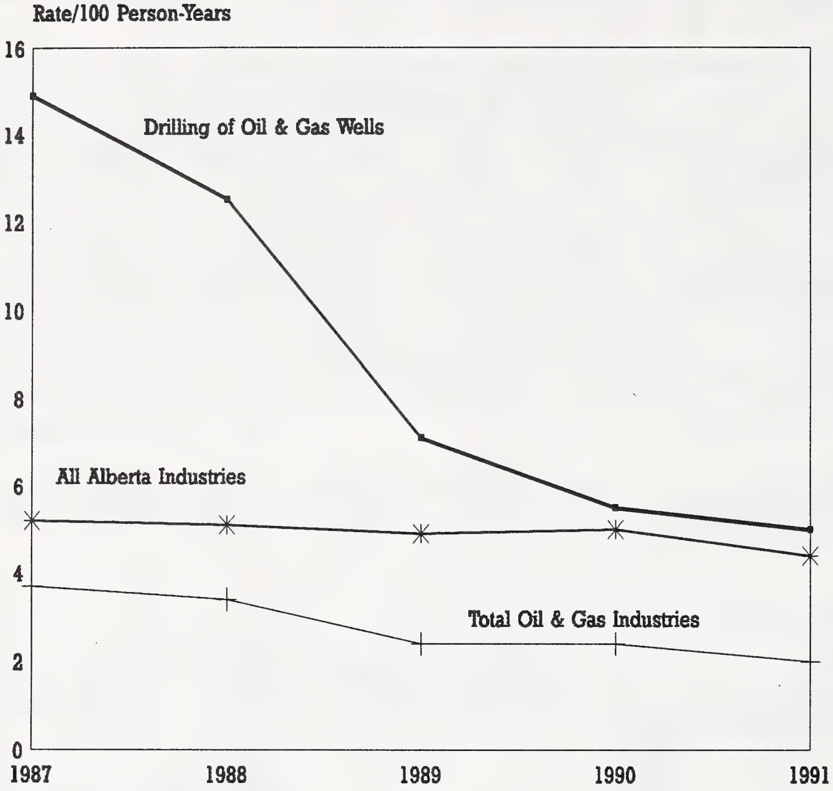

Figure C1: Estimated lost-time claim rates for the drilling of oil and gas wells in Alberta, the total oil and gas industry, and for all Alberta industries, 1987-1991.

Source: AOHS Annual Rate Report, 1987-1991; Research & Information Development

2 *Lost-Time Claims By Source Of Injury And Accident Type*

LOST-TIME CLAIMS BY SOURCE OF INJURY

Source of Injury	**# Claims**	**% Claims**
Metal items	491	25.6
Hoisting apparatus	433	22.5
Working surface	233	12.1
Unpowered handtool	110	5.7
Bodily Motion	112	5.8
Chemicals	60	3.1
Boxes, containers	43	2.2
Other	439	22.9
TOTAL	1,921	100.0

Table C2: Lost-time claims by source of injury in the drilling of oil and gas wells in Alberta from 1987 to 1991.

The major source of injury were metal items (26%) and hoisting apparatus (23%). The typical injury accident was due to being struck or caught between objects (27.8% and 23.6% respectively).

LOST-TIME CLAIMS BY TYPE OF ACCIDENT

Type of Accident	**# Claims**	**% Claims**
Struck by object	534	27.8
Caught in, under, between	453	23.6
Overexertion	250	13.0
Fall from elevation	169	8.8
Fall on same level	126	6.6
Bodily reaction	111	5.8
Contact toxic substance	56	2.9
Temperature extremes	44	2.3
Other, unknown	178	9.3
TOTAL	1,921	100.0

Table C3: Lost-time claims by type of accident in the drilling of oil and gas wells in Alberta from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 - 1991.

3 *Lost-Time Claims By Nature Of Injury And Part Of Body Injured*

LOST-TIME CLAIMS BY NATURE OF INJURY

Nature of Injury	# Claims	% Claims
Sprain, strain	457	23.8
Dislocation, fracture	411	21.4
Multiple injury	378	19.7
Bruise, crushing	280	14.6
Cut, laceration	150	7.8
Chemical burn	53	2.8
Burns, scalds	36	1.9
Other	156	8.1
TOTAL	1,921	100.0

Table C4: Lost-time claims by nature of injury in the drilling of oil and gas well industry in Alberta from 1987 to 1991.

Most injuries were sprains and strains (23.8%) followed closely by dislocations and fractures (21.4%). Fingers were the most frequent part of body injured (21%).

LOST-TIME CLAIMS BY PART OF BODY INJURED

Part of Body Injured	# Claims	% Claims
Fingers	398	20.7
Back	272	14.2
Multiple parts	259	13.5
Leg	246	12.8
Ankle, foot	188	9.8
Other trunk	182	9.5
Wrist, hand	143	7.4
Arm	90	4.7
Other	143	7.4
TOTAL	1,921	100.0

Table C5: Lost-time claims by part of body injured in the drilling of oil and gas wells in Alberta from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 - 1991.

3 *Lost-Time Claims By Age Of Claimant And Length Of Time Employed*

LOST-TIME CLAIMS BY AGE OF CLAIMANT

Age of Claimant	**#[1] Claims**	**% Claims**
15 - 24 years	727	37.8
25 - 34 years	936	48.7
35 - 44 years	186	9.7
45 - 54 years	49	2.6
55+ years	14	0.7
Unknown	9	0.5
TOTAL	1,921	100.0

Table C6: Lost-time claims by age of claimant in the drilling of oil and gas wells in Alberta from 1987 to 1991.

At the time of injury 49% of claimants were between 25 and 34 years of age, and 38% were between 15 and 24 years of age. 53% had been with their employer less than 6 months.

LOST-TIME CLAIMS BY LENGTH OF TIME EMPLOYED

Length of Time Employed	**#[1] Claims**	**% Claims**
Less than 1 month	624	32.5
1 - 6 months	389	20.2
6 months - 1 year	93	4.8
1 year or more	284	14.8
Unknown	531	27.6
TOTAL	1,921	100.0

Table C7: Lost-time claims by length of time employed in the drilling of oil and gas wells in Alberta from 1987 to 1991.

Note: Frequency of a lost-time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 - 1991.

5. Lost-Time Claims By Days Lost

42% of injuries resulted in more than 50 days of lost work.

LOST-TIME CLAIMS BY DAYS LOST

Days Lost	# Claims	% Claims
1 - 5 days	127	6.6
6 - 10 days	211	11.0
11 - 15 days	181	9.4
16 - 20 days	124	6.5
21 - 30 days	153	8.0
31 - 40 days	162	8.4
41 - 50 days	144	7.5
50+ days	797	41.5
Unknown	22	1.1
TOTAL	3,414	100.0

Table C8: Lost-time claims by days lost in the drilling of oil and gas wells in Alberta from 1984 to 1991.

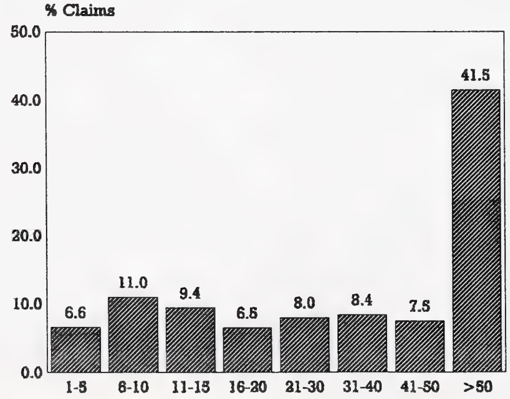

Figure C2: Lost-time claims by days lost in the drilling of oil and gas wells in Alberta, 1987-1991.

Note: Lost-time claims result in loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

D. WELL SERVICING WITH SERVICE RIGS

1. *Estimated Lost-Time Claim Rates*

The number of lost-time claims in the service rig industry have declined considerably from 352 lost-time claims in 1987 to 142 lost-time claims in 1991; a 60% decline. There was no significant decrease in the number of person-years within this time period.

ESTIMATED LOST-TIME CLAIM RATES

	1987	1988	1989	1990	1991
Well Servicing with Service Rigs: 9903					
Lost-Time Claims[1]	352	321	201	194	142
Estimated Person-Years	2,519	2,657	2,277	2,513	2,491
Industry Average Claim Rate[2]	14.0	12.1	8.8	7.7	5.7
Severity Rate[3]	742	656	604	565	516
Total Oil and Gas Industries					
Lost-Time Claims	2,271	2,294	1,496	1,463	1,238
Estimated Person-Years	61,291	67,698	61,175	61,669	61,104
Industry Average Claim Rate	3.7	3.4	2.4	2.4	2.0
All Alberta Industries					
Lost-Time Claims	40,489	42,858	42,342	43,470	37,688
Estimated Person-Years	784,466	833,264	855,747	874,525	860,352
Industry Average Claim Rate	5.2	5.1	4.9	5.0	4.4

Notes:

[1] Lost-time claims result in loss of work beyond the day of accident.

[2] Claim rate = (lost-time claims/person years) x 100.

[3] Severity rate = (compensation days paid x 100) ÷ person years

Compensation days paid by WCB are accumulated through to March 31 of the following year; days paid after this date are not included in the calculation. No allowance is made for fatalities.

Table D1: Estimated lost-time claim rates for the well servicing with service rigs industry in Alberta from 1987 to 1991.

Source: Alberta Occupational Health and Safety Annual Injury Rate Report, 1987 to 1991.

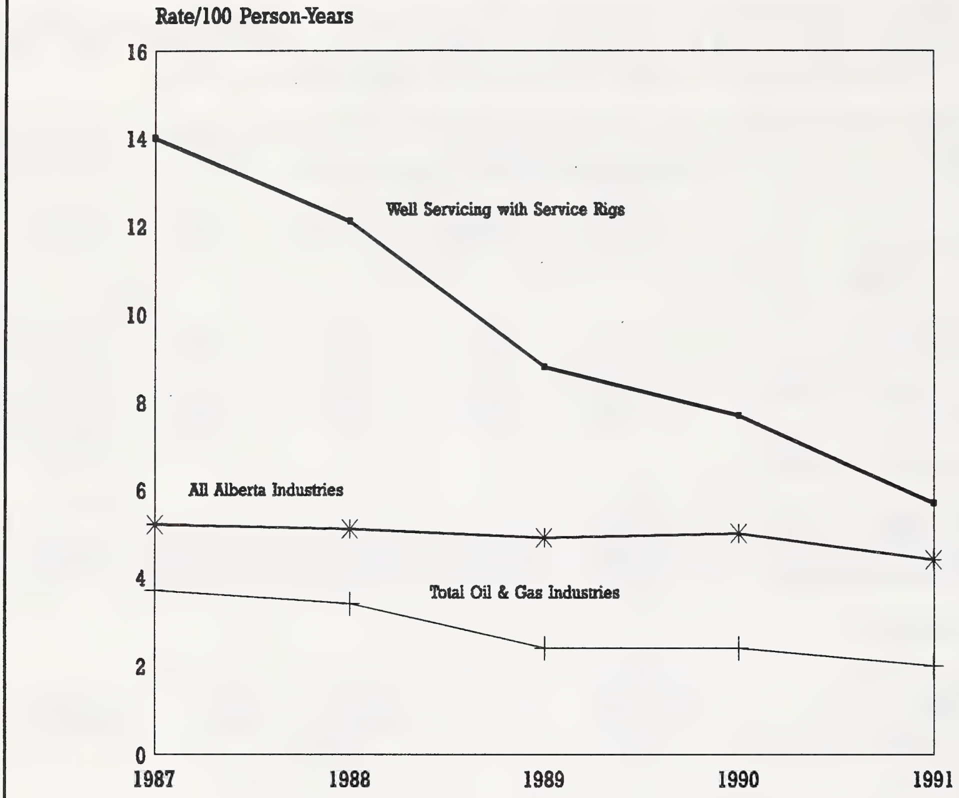

Figure D1: Estimated lost-time claim rates for well servicing with service rigs, total oil and gas industries, and all Alberta industries, 1987-1991.

Source: AOHS Annual Rate Report, 1987-1991; Research & Information Development

2. *Lost-Time Claims By Source Of Injury And Accident Type.*

LOST-TIME CLAIMS BY SOURCE OF INJURY

Source of Injury	# Claims	% Claims
Metal items	304	25.1
Working surfaces	169	13.9
Unpowered handtool	136	11.2
Hoisting apparatus	142	11.7
Bodily motion	93	7.7
Vehicles	53	4.4
Other	315	25.9
TOTAL	1,212	100.0

Table D2: Lost-time claims by source of injury in the well servicing with service rigs industry in Alberta from 1987 to 1991.

In the well servicing with service rigs industry the most frequent source of injury was metal items (25%), followed by working surfaces (14%). Injury accidents typically involved being struck by an object (25%), being caught in objects (18%), and overexertion (16%).

LOST-TIME CLAIMS BY TYPE OF ACCIDENT

Type of Accident	# Claims	% Claims
Struck by object	305	25.2
Caught in, under, between	220	18.2
Overexertion	194	16.0
Fall from elevation	144	11.9
Bodily reaction	93	7.7
Fall on same level	58	4.8
Vehicle accidents	44	3.6
Temperature extremes	27	2.2
Other	127	10.5
TOTAL	1,212	100.0

Table D3: Lost-time claims by type of accident in the well servicing with service rigs industry in Alberta from 1987 to 1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

3. Lost-Time Claims By Nature Of Injury And Part Of Body Injured.

LOST-TIME CLAIMS BY NATURE OF INJURY

Nature of Injury	**# Claims**	**% Claims**
Sprain, strain	361	29.8
Dislocation, fracture	227	18.7
Multiple injury	207	17.1
Bruise, crushing	168	13.9
Cut, laceration	95	7.8
Other disease	31	2.6
Inflammation of joints, tendons	28	2.3
Other	95	7.8
TOTAL	1,212	100.0

Table D4: Lost-time claims by nature of injury in the service rig industry in Alberta from 1987 to 1991.

The most frequent injuries were sprains and strains (30%), dislocations and fractures (19%), and multiple injuries (17%). Fingers were the most frequent part of body injured (19%), followed by the back (18%), and multiple parts (15%).

LOST-TIME CLAIMS BY PART OF BODY INJURED

Part of Body Injured	**# Claims**	**% Claims**
Fingers	224	18.5
Back	215	17.7
Multiple parts	176	14.5
Ankle, foot	128	10.6
Leg	112	9.2
Other trunk	109	9.0
Wrist, hand	83	6.8
Arm	64	5.3
Face, head, neck	57	4.7
Other	44	3.6
TOTAL	1,212	100.0

Table D5: Lost-time claims by part of body injured in the well servicing with service rigs industry in Alberta from 1987 to 1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

4. Lost-Time Claims By Age Of Claimant And Length Of Time Employed.

LOST-TIME CLAIMS BY AGE OF CLAIMANT

Age of Claimant	# Claims	% Claims
15 - 24 years	466	38.4
25 - 34 years	649	53.5
35 - 44 years	73	6.0
45 - 54 years	18	1.5
55 - 64 years	4	.3
Unknown	2	.2
TOTAL	1,212	100.0

Table D6: Lost-time claims by age of claimant in the well servicing with service rigs industry in Alberta from 1987 to 1991.

At the time of injury the majority of claimants were less than 35 years old (92%). 42% had worked less than 6 months with their current employer, and 52% had worked less than one year with thier current employer.

LOST-TIME CLAIMS BY LENGTH OF TIME EMPLOYED

Length of Time Employed	# Claims	% Claims
Less than 1 month	233	19.2
1 - 6 months	279	23.0
6 months - 1 year	117	9.7
More than 1 year	234	19.3
Unknown	349	28.8
TOTAL	1,212	100.0

Table D7: Lost-time claims by length of time employed in the well servicing with service rigs industry in Alberta from 1987 to 1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

5. Lost-Time Claims By Days Lost

LOST-TIME CLAIMS BY DAYS LOST

Days Lost	**# Claims**	**% Claims**
1 - 5 days	118	9.7
6 - 10 days	158	13.0
11 - 15 days	135	11.1
16 - 20 days	90	7.4
21 - 30 days	117	9.7
31 - 40 days	86	7.1
41 - 50 days	65	5.4
50+	432	35.6
Unknown	11	0.9
TOTAL	1,212	100.0

Table D8: Lost-time claims by days lost the well servicing with service rigs industry in Alberta from 1987 to 1991.

36% of injuries resulted in more than 50 days of lost work between 1987 and 1991.

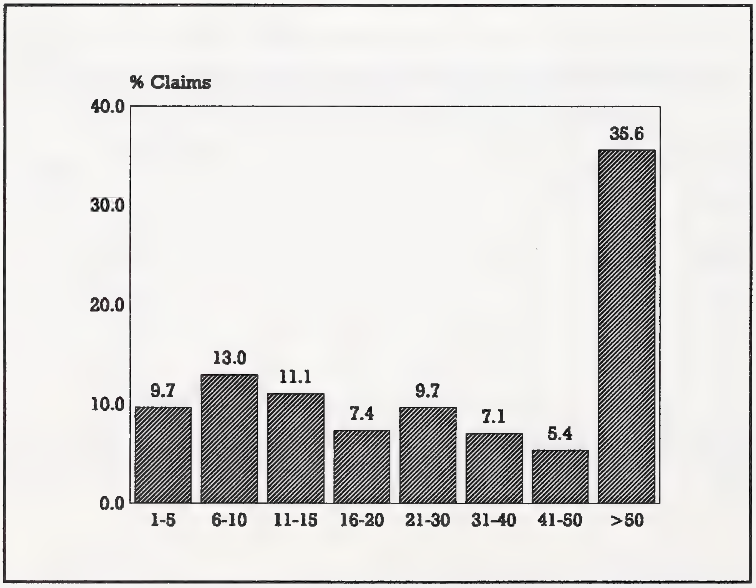

Figure D2: Lost-time claims by days lost, well servicing with service rigs,1987-1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

E. OTHER FIELD SERVICES

1. *Estimated lost-time claim rates*

There has been a 23% decline in the number of lost time claims between 1987 and 1991 in this industry.

ESTIMATED LOST-TIME CLAIM RATES

	1987	1988	1989	1990	1991
Other Field Services					
Lost-Time Claims[1]	322	311	223	265	248
Estimated Person-Years	6,401	7,259	7,132	6,857	7,378
Industry Average Claim Rate[2]	5.0	4.3	3.1	3.9	3.4
Severity Rate[3]	248	202	164	218	191
Total Oil and Gas Industries					
Lost-Time Claims	2,271	2,294	1,496	1,463	1,238
Estimated Person-Years	61,291	67,698	61,175	61,669	61,104
Industry Average Claim Rate	3.7	3.4	2.4	2.4	2.0
All Alberta Industries					
Lost-Time Claims	40,489	42,858	42,342	43,470	37,688
Estimated Person-Years	784,466	833,264	855,747	874,525	860,352
Industry Average Claim Rate	5.2	5.1	4.9	5.0	4.4

Notes:

1 Lost-time claims result in loss of work beyond the day of accident.

2 Claim rate = (lost-time claims/person years) x 100.

3 Severity rate = (compensation days paid x 100) ÷ person years

Compensation days paid by WCB are accumulated through to March 31 of the following year; days paid after this date are not included in the calculation. No allowance is made for fatalities.

Table E1: Estimated lost-time claim rates for other field services in Alberta from 1987 to 1991.

Source: Alberta Occupational Health and Safety Annual Injury Rate Report, 1987 to 1991.

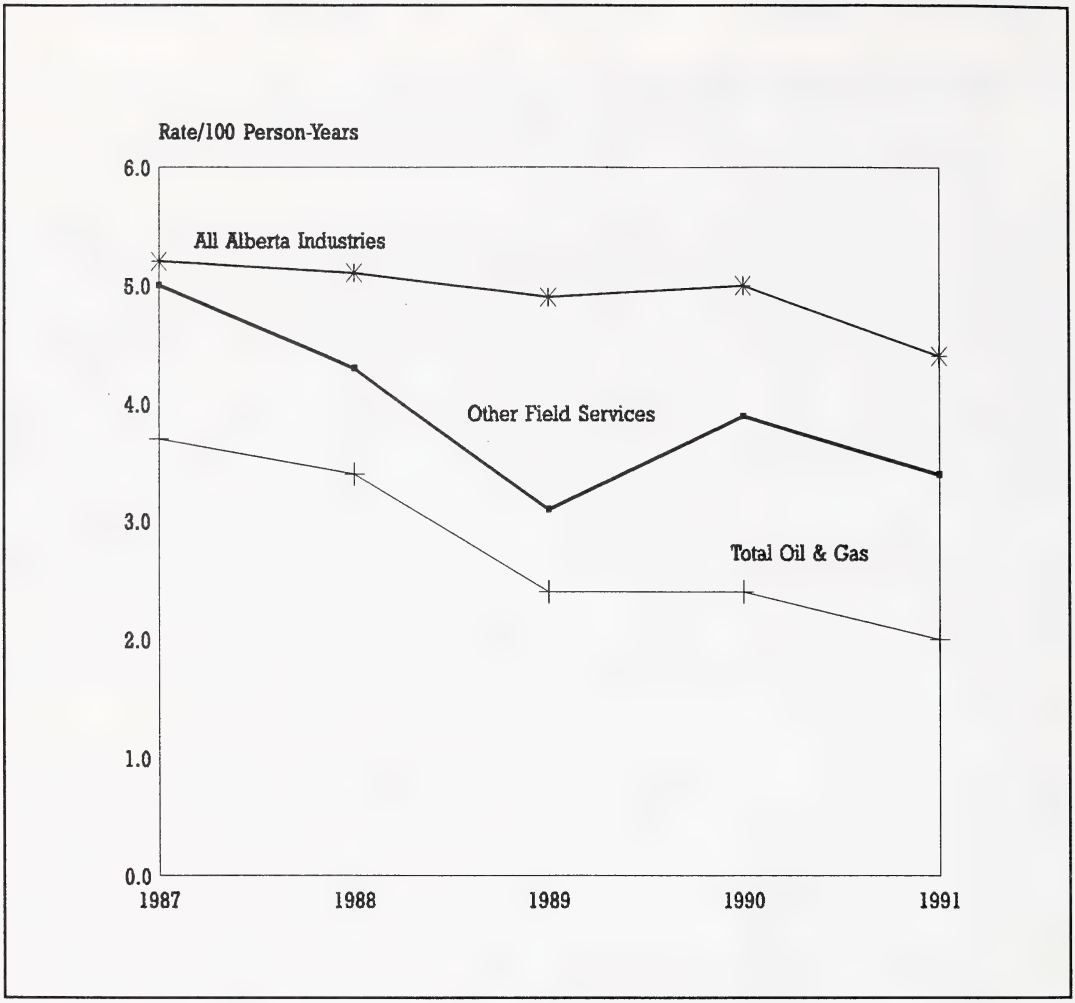

Figure E1:Estimated lost-time claim rates for other field services, total oil and gas industries, and all Alberta industries, 1987-1991.

Source: AOHS Annual Rate Report, 1987-1991; Research & Information Development

2. Lost-Time Claims By Source Of Injury And Accident Type.

LOST-TIME CLAIMS BY SOURCE OF INJURY

Source of Injury	# Claims	% Claims
Metal items	199	15.5
Working surfaces	170	13.3
Bodily motion	166	12.9
Vehicles	161	12.5
Unpowered handtools	86	6.7
Boxes, containers	46	3.6
Hoisting apparatus	40	3.1
Chemicals	39	3.0
Powered handtools	25	1.9
Other	351	27.4
TOTAL	1,283	100.0

Table E2: Lost-time claims by source of injury in other field services in Alberta from 1987 to 1991.

The most common sources of injury between 1987 and 1991 in this industry were metal items (16%), working surfaces (13%), and bodily motion (13%). The most frequent type of accident was due to overexertion (23%), being struck by an object (15%), and bodily reaction (13%).

LOST-TIME CLAIMS BY TYPE OF ACCIDENT

Type of Accident	# Claims	% Claims
Overexertion	296	23.1
Struck by object	187	14.6
Bodily reaction	166	12.9
Fall from elevation	134	10.4
Vehicle accidents	130	10.1
Caught in, under, between	117	9.1
Fall on same level	73	5.7
Temperature extremes	42	3.3
Contact toxic substances	38	3.0
Other	100	7.8
TOTAL	1,283	100.0

Table E3: Lost-time claims by type of accident in other field services in Alberta from 1987 to 1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

3. Lost-Time Claims By Nature Of Injury And Part Of Body Injured.

LOST-TIME CLAIMS BY NATURE OF INJURY

Nature of Injury	# Claims	% Claims
Sprain, strain	549	42.8
Multiple injury	186	14.5
Dislocation, fracture	173	13.5
Bruise, crushing	116	9.0
Cut, laceration	63	4.9
Burns, scalds	40	3.1
Other disease	33	2.6
Other	123	9.6
TOTAL	1,283	100.0

Table E4: Lost-time claims by nature of injury in the in other field services in Alberta from 1987 to 1991.

Between 1987 and 1991 43% of injuries were sprains and strains, 15% were multiple injuries, and 14% were dislocations and fractures. Injuries to the back occurred the most frequently at 26%, followed by 16% to multiple parts, and 10% to an ankle or foot.

LOST-TIME CLAIMS BY PART OF BODY INJURED

Part of Body Injured	# Claims	% Claims
Back	333	26.0
Multiple parts	208	16.2
Ankle, foot	132	10.3
Fingers	122	9.5
Other trunk	121	9.4
Leg	109	8.5
Wrist, hand	82	6.4
Face, head, neck	60	4.7
Arm	56	4.4
Eyes	39	3.0
Other	21	1.6
TOTAL	1,283	100.0

Table E5: Lost-time claims by part of body injured in other field services in Alberta from 1987 to 1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

4. Lost-Time Claims By Age Of Claimant And Length Of Time Employed.

LOST-TIME CLAIMS BY AGE OF CLAIMANT

Age of Claimant	# Claims	% Claims
15 - 24 years	278	21.7
25 - 34 years	666	51.9
35 - 44 years	222	17.3
45 - 54 years	81	6.3
55+	34	2.7
Unknown	2	0.2
TOTAL	1,283	100.0

Table E6: Lost-time claims by age of claimant in other field services in Alberta from 1987 to 1991.

Almost three quarters of the claimants were less than 35 years old (74%), and almost one third had been with their employer one year or more.

LOST-TIME CLAIMS BY LENGTH OF TIME EMPLOYED

Length of Time Employed	# Claims	% Claims
Less than 1 month	138	10.8
1 - 6 months	283	22.1
6 months - 1 year	157	12.2
More than 1 year	392	30.6
Unknown	313	24.4
TOTAL	1,283	100.0

Table E7: Lost-time claims by length of time employed in other field services in Alberta from 1987 to 1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

5. Lost-Time Claims By Days Lost

LOST-TIME CLAIMS BY DAYS LOST

Days Lost	# Claims	% Claims
1 - 5 days	226	17.6
6 - 10 days	202	15.7
11 - 15 days	158	12.3
16 - 20 days	107	8.3
21 - 30 days	84	6.5
31 - 40 days	63	4.9
41 - 50 days	61	4.8
50+ days	362	28.2
Unknown	20	1.6
TOTAL	1,283	100.0

Table E8: Lost-time claims by days lost in other field services in Alberta from 1987 to 1991.

28% of claims resulted in more than 50 days of work lost. One to five work days were lost as a result of 18% of injuries.

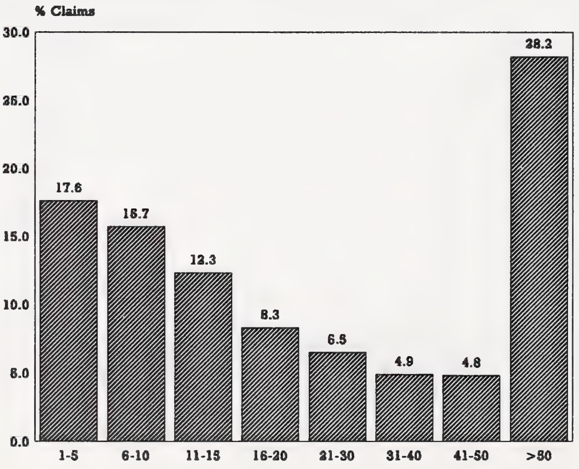

Figure E2: Lost-time claims by days lost in other field services,1987-1991.

Note: Lost-time claims result in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987 to 1991.

F. WELL OPERATIONS

1. Estimated lost-time claim-rates

The injury rate has been constant for the past three years in this industry; it is very low at 0.4 lost-time injuries per 100 person-years worked.

ESTIMATED LOST-TIME CLAIM RATES

INDUSTRY	**1987**	**1988**	**1989**	**1990**	**1991**
Well Operations Industry					
Lost-time claims[1]	136	169	126	115	127
Estimated person-years	30,460	33,696	30,668	30,037	29,672
Industry average claim rate[2]	0.4	0.5	0.4	0.4	0.4
Severity rate[3]	15	15	10	10	15
Total Oil and Gas Industry					
Lost-time claims	2,271	2,294	1,496	1,463	1,238
Estimated person-years	61,291	67,698	61,175	61,669	61,104
Industry average claim rate	3.7	3.4	2.4	2.4	2.0
All Alberta Industries					
Lost-time claims	40,489	42,858	42,342	43,470	37,688
Estimated person-years	784,466	833,264	855,747	874,525	860,352
Industry average claim rate	5.2	5.1	4.9	5.0	4.4

Notes: 1. Lost-time claims result in loss of work beyond the day of injury.

2. Claim rate = (lost-time claims/person years) x 100

3. Severity rate = (compensation days paid x 100) ÷ person-years.

Compensation days paid by WCB are accumulated through to March 31 of the following year; days paid after this date are not included in the total. No allowance is made for fatalities.

Table F1: Estimated lost-time claim rates in well operations in Alberta from 1987 to 1991.

Source: Alberta Occupational Health and Safety Annual Injury Rate Report, 1987 - 1991.

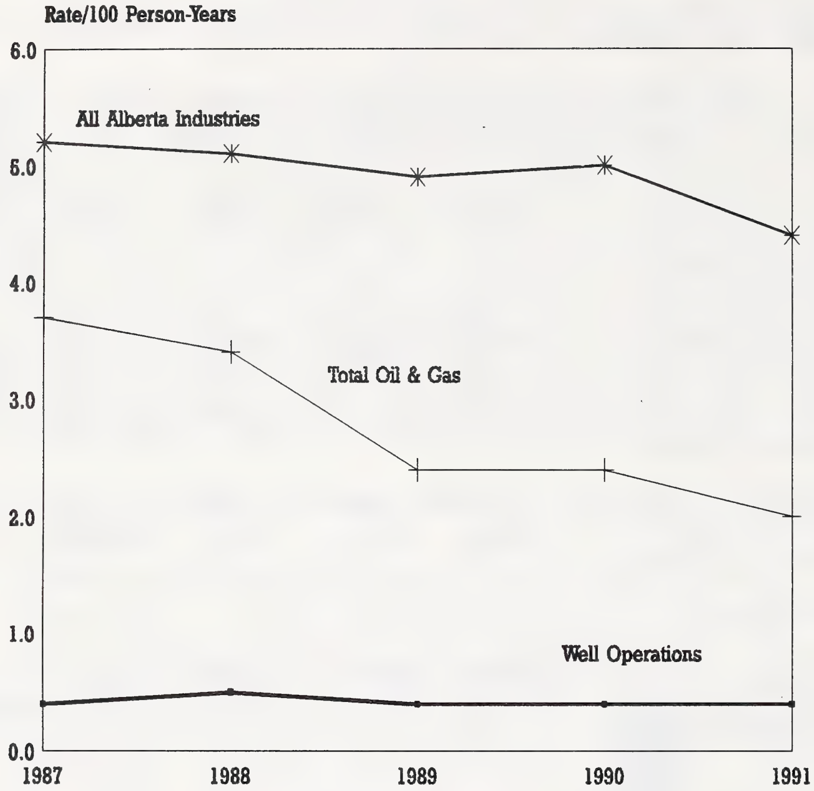

Figure F1: Estimated lost-time claim rates for well operations in Alberta, total oil and gas industries, and all Alberta industries.

Source: AOHS Annual Rate Report, 1987-1991; Research & Information Development

2. Lost-time claims by source of injury and accident type

CLAIMS BY SOURCE OF INJURY

Source of Injury	**# Claims**	**% Claims**
Bodily motion	103	15.6
Working surfaces	89	13.5
Vehicles	66	10.0
Boxes, containers	61	9.2
Metal items	58	8.8
Flame, fire, smoke	40	6.1
Unpowered handtools	26	3.9
Chemicals	26	3.9
Machines	17	2.6
Furniture, fixtures	18	2.7
Other	156	23.6
TOTAL	660	100.0

Table F2: Lost-time claims by source of injury in well operations in Alberta, from 1987 to 1991.

Bodily motion (16%), working surfaces (14%), and vehicles (10%) were the most common sources of injury between 1987 and 1991. The typical injury accident involved overexertion (21%), bodily reaction (16%), and being struck by an object (10%).

CLAIMS BY ACCIDENT TYPE

Accident Type	**# Claims**	**% Claims**
Overexertion	138	20.9
Bodily reaction	103	15.6
Struck by object	67	10.2
Fall on same level	64	9.7
Vehicle accidents	64	9.7
Fall from elevation	53	8.0
Temperature extremes	44	6.7
Caught in, under, between	39	5.9
Contact toxic substance	32	4.8
Struck against object	18	2.7
Other	38	5.8
TOTAL	660	100.0

Table F3: Lost-time claims by accident type in well operations in Alberta from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of the accident.

Source: Workers' Compensation Board Statistical Master File, 1987-1991.

3. Lost-time claims by nature of injury and part of body injured

CLAIMS BY NATURE OF INJURY

Nature of Injury	# Claims	% Claims
Sprain, strain	283	42.9
Multiple injury	85	12.9
Dislocation, fracture	65	9.8
Bruise, crushing	60	9.1
Burns, scalds	50	7.6
Other disease	29	4.4
Cut, laceration	27	4.1
Other	61	9.2
TOTAL	660	100.0

Table F4: Lost-time claims by nature of injury in well operations in Alberta from 1987 to 1991.

Sprains and strains were the most frequent injury (43%), followed by multiple injury accidents (13%). 27% of injuries occurred to the back, and a further 20% involved multiple parts of the body.

CLAIMS BY PART OF BODY INJURED

Part of Body	# Claims	% Claims
Back	180	27.3
Multiple parts	134	20.3
Ankle, foot	60	9.1
Leg	57	8.6
Other trunk	52	7.9
Face, head, neck	52	7.9
Fingers	34	5.2
Eyes	30	4.5
Arm	24	3.6
Wrist, hand	21	3.2
Other	16	2.4
TOTAL	660	100.0

Table F5: Lost-time claims by part of body injured in well operations in Alberta from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of accident.

Source: Workers Compensation Board Statistical Master File, 1987-1991.

4. Lost-time claims by age of claimant and length of time employed

CLAIMS BY AGE OF CLAIMANT		
Age of Claimant	**# Claims**	**% Claims**
15 - 24 years	71	12.0
25 - 34 years	279	42.3
35 - 44 years	153	23.2
45 - 54 years	91	13.8
55+ years	55	8.3
Unknown	3	0.5
TOTAL	660	100.0

Table F6: Lost-time claims by age of claimant in well operations in Alberta from 1987 to 1991.

54% of workers were under 35 years of age, and the majority had been with their employer one year or more (62%).

CLAIMS BY LENGTH OF TIME EMPLOYED		
Length of Time Employed	**# Claims**	**% Claims**
Less than 1 month	15	2.3
1 - 6 months	59	8.9
6 months to 1 year	56	8.5
1 year or more	412	62.4
Unknown	118	17.9
TOTAL	660	100.0

Table F7: Lost-time claims by length of time employed in well operations in Alberta from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of accident.

5. Lost-time claims by days lost

CLAIMS BY DAYS LOST		
Days Lost	**# Claims**	**% Claims**
1 - 5 days	242	36.7
6 - 10 days	118	17.9
11 - 15 days	49	7.4
16 - 20 days	25	3.8
21 - 30 days	46	7.0
31 - 40 days	23	3.5
41 - 50 days	26	3.9
>50 days	107	16.2
Unknown	24	3.6
TOTAL	660	100.0

Table F8: Lost-time claims by days lost in well operations in Alberta from 1987 to 1991.

Most injuries in this industry were of a short duration; between 1987 and 1991 55% of injuries resulted in less than 11 days lost from work. Only 16% resulted in more than 50 days lost from work.

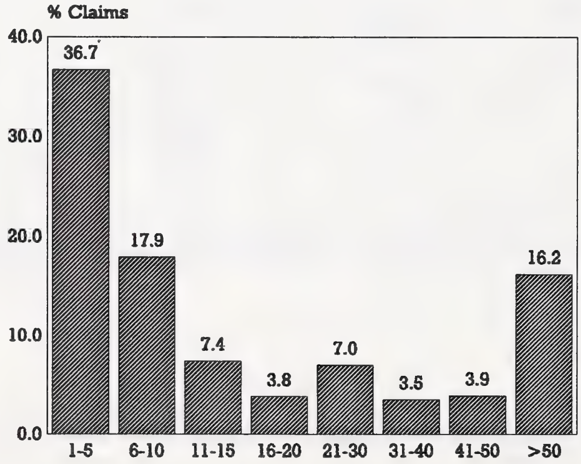

Figure F2: Lost-time claims by days lost in well operations in Alberta, 1987-1991.

Note: A lost-time claim results in a loss of work beyond the day of accident.

Source: Workers Compensation Board Statistical Master File, 1987-1991.

G. GAS PLANTS

1. Estimated lost-time claim rates

Lost-time injury rates have declined since 1990. There were 37% fewer time-loss claims between 1987 and 1991.

ESTIMATED LOST-TIME CLAIM RATES

INDUSTRY	**1987**	**1988**	**1989**	**1990**	**1991**
Gas Plants Industry					
Lost-time claims[1]	41	56	39	42	26
Estimated person-years	6,394	7,148	6,022	6,601	6,734
Industry average claim rate[2]	0.6	0.8	0.6	0.6	0.4
Severity rate[3]	11	25	14	13	16
Total Oil and Gas Industry					
Lost-time claims	2,271	2,294	1,496	1,463	1,238
Estimated person-years	61,291	67,698	61,175	61,669	61,104
Industry average claim rate	3.7	3.4	2.4	2.4	2.0
All Alberta Industries					
Lost-time claims	40,489	42,858	42,342	43,470	37,688
Estimated person-years	784,466	833,264	855,747	874,525	860,352
Industry average claim rate	5.2	5.1	4.9	5.0	4.4

Notes:

1. Lost-time claims result in loss of work beyond the day of injury.
2. Claim rate = (lost-time claims/person years) x 100
3. Severity rate = (compensation days paid x 100) ÷ person-years.

Compensation days paid by WCB are accumulated through to March 31 of the following year; days paid after this date are not included in the total. No allowance is made for fatalities.

Table G1: Estimated lost-time claim rates in gas plants in Alberta from 1987 to 1991.

Source: Alberta Occupational Health and Safety Annual Injury Rate Report, 1987 - 1991.

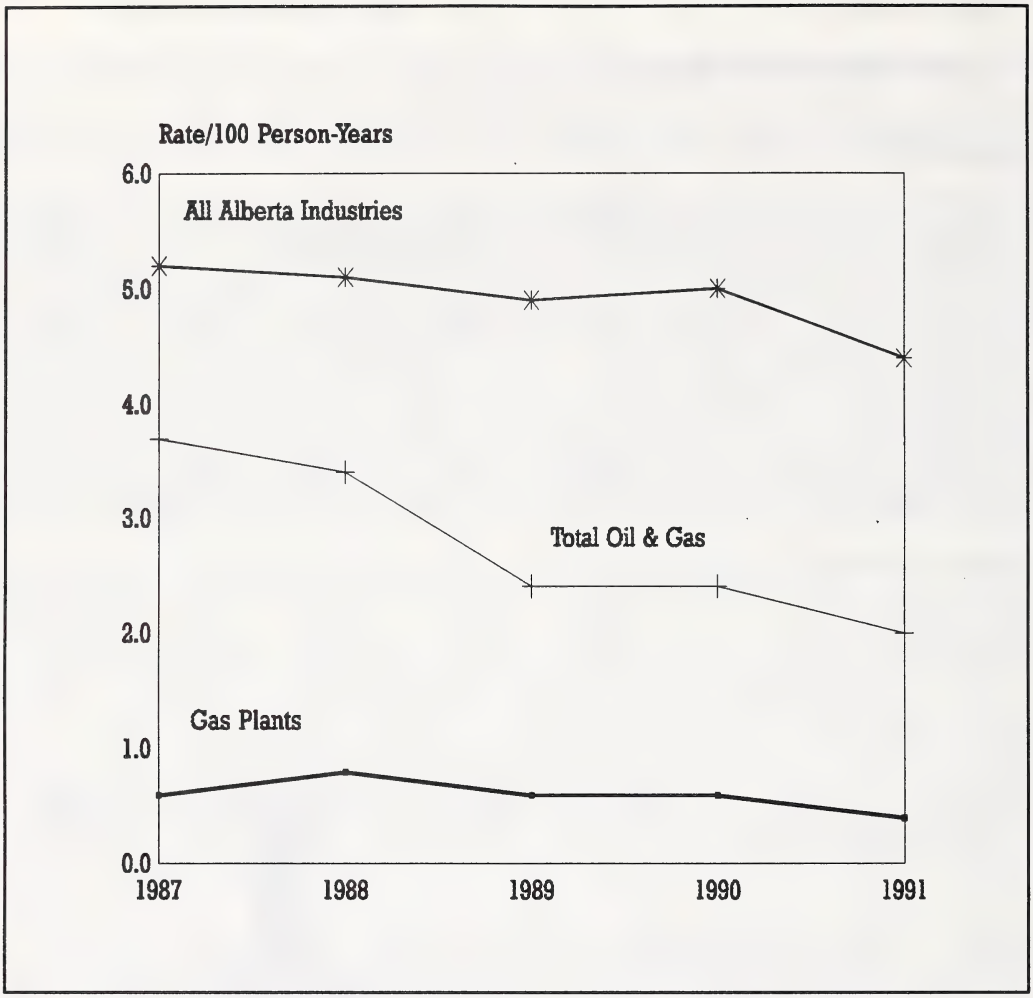

Figure G1: Estimated lost-time claim rates in gas plants in Alberta, 1987-1991.

Source: AOHS Annual Rate Report, 1987-1991; Research & Information Development

2. *Lost-time claims by source of injury and accident type*

CLAIMS BY SOURCE OF INJURY

Source of Injury	**# Claims**	**% Claims**
Working surfaces	38	18.7
Chemicals	22	10.8
Bodily motion	34	16.7
Metal items	17	8.4
Unpowered handtools	16	7.9
Boxes, containers	8	3.9
Vehicles	7	3.4
Flame, fire, smoke	4	2.0
Other	57	28.1
TOTAL	203	100.0

Table G2: Lost-time claims by source of injury in gas plants in Alberta, from 1987 to 1991.

The most common sources of injury over the past five years have been working surfaces (19%), bodily motion (17%), and chemicals (11%). Flame, fire and smoke accounted for only 2% of injuries. The majority of accidents involved either bodily reaction (17%), overexertion (16%), or a fall from elevation (14%).

CLAIMS BY ACCIDENT TYPE

Accident Type	**# Claims**	**% Claims**
Bodily reaction	34	16.7
Overexertion	32	15.8
Fall from elevation	27	13.3
Struck by object	21	10.3
Contact toxic substances	15	7.4
Fall on same level	15	7.4
Caught in, under, between	15	7.4
Temperature Extremes	12	5.9
Vehicle	8	3.9
Struck against object	5	2.5
Other	19	9.4
TOTAL	203	100.0

Table G3: Lost-time claims by accident type in gas plants in Alberta, from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of accident.

Source: Workers Compensation Board Statistical Master File, 1987-1991.

3. Lost-time claims by nature of injury and part of body injured

CLAIMS BY NATURE OF INJURY

Nature of Injury	# Claims	% Claims
Sprain, strain	76	37.4
Multiple injury	24	11.8
Bruise, crushing	23	11.3
Dislocation, fracture	17	8.4
Burns, scalds	12	5.9
Cut, laceration	9	4.4
Chemical burn	8	3.9
Respiratory poisoning	6	3.0
Other	28	13.8
TOTAL	203	100.0

Table G4: Lost-time claims by nature of injury in gas plants in Alberta, from 1987 to 1991.

Sprains and strains accounted for 37% of injuries. 23% of injuries occured to the back, and 17% involved multiple parts.

CLAIMS BY PART OF BODY INJURED

Part of Body	# Claims	% Claims
Back	47	23.2
Multiple parts	34	16.7
Other trunk	22	10.8
Ankle, foot	21	10.3
Face, head, neck	19	9.4
Leg	17	8.4
Fingers	14	6.9
Arm	9	4.4
Wrist, hand	8	3.9
Respiratory system	6	3.0
Eyes	4	2.0
Other	2	1.0
TOTAL	203	100.0

Table G5: Lost-time claims by part of body injured in gas plants in Alberta, from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of accident.

Source: Workers Compensation Board Statistical Master File, 1987-1991.

4. *Lost-time claims by age of claimant and length of time employed*

CLAIMS BY AGE OF CLAIMANT		
Age of Claimant	**# Claims**	**% Claims**
15 - 24 years	27	13.3
25 - 34 years	68	33.5
35 - 44 years	51	25.1
45 - 54 years	34	16.7
55+ years	21	10.3
Unknown	2	1.0
TOTAL	203	100.0

Table G6: Lost-time claims by age of claimant in gas plants in Alberta, from 1987 to 1991.

47% of claimants were less than 35 years old, and 62% had been with their employer one year or more.

CLAIMS BY LENGTH OF TIME EMPLOYED		
Length of Time Employed	**# Claims**	**% Claims**
less than 1 month	6	3.0
1 - 6 months	21	10.3
6 months - 1 year	13	6.4
1 year or more	125	61.6
Unknown	38	18.7
TOTAL	203	100.0

Table G7: Lost-time claims by length of time employed in gas plants in Alberta, from 1987 to 1991.

Note: A lost-time claim results in a loss of work beyond the day of accident.

5. Lost-time claims by days lost

CLAIMS BY DAYS LOST		
Days Lost	**# Claims**	**% Claims**
1 - 5 days	70	34.5
6 - 10 days	36	17.7
11 - 15 days	17	8.4
16 - 20 days	13	6.4
21 - 30 days	6	3.0
31 - 40 days	7	3.4
41 - 50 days	7	3.4
>50 days	33	16.3
Unknown	14	6.9
TOTAL	203	100.0

Table G8: Lost-time claims by days lost in gas plants in Alberta, from 1987 to 1991.

As in well operations, most injuries in the gas plant industry were of short duration. 52% of injuries resulted in less than 11 days of lost work, and 16% resulted in more than 50 days of lost work.

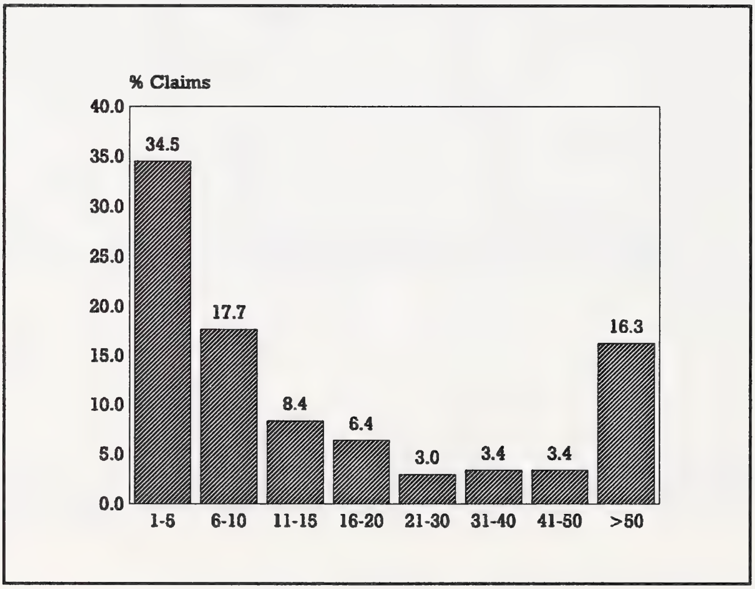

Figure G2: Lost-time claims by days lost in gas plants in Alberta, 1987-1991.

Note: A lost-time claim results in a loss of work beyond the day of accident.

Source: Workers Compensation Board Statistical Master File, 1987-1991.

APPENDIX A

FATALITES INVESTIGATED BY ALBERTA OCCUPATIONAL HEALTH AND SAFETY
OIL AND GAS INDUSTRIES
ALBERTA, 1987 - 1991

Alberta Occupational Health and Safety investigates most of the occupational fatalities that occur on Alberta worksites. All traumatic worksite injuries that result in death are investigated, and some other types of incident are investigated too. AOHS does not usually investigate highway traffic fatalities, or occupational deaths due to heart attack or disease.

There is not a complete correspondence between fatalities investigated by AOHS and those accepted by the WCB in any given year. One reason for this is that AOHS investigations are dated by the year of the injury, whereas WCB acceptance may not occur until the following year or later. In addition, the WCB accepts fatalities that are not investigated by AOHS (e.g. disease, highway, vehicle accidents).

The information presented in this appendix is a summary of the circumstances surrounding traumatic worksite fatalities in the oil and gas industry. Further information can be obtained by contacting Research and Information Development, Alberta Occupational Health & Safety (403-427-8943).

YEAR: 1987 AGE: 36
OCCUPATION: Driller FILE: 0561
INDUSTRY: Shot Hole Drilling Operations
EXPERIENCE: 15 years

DESCRIPTION: Two workers were operating a leased top drive auger-type seismic rig (on rubber) on a petroleum company lease. The two were drilling shot holes when the equipment experienced difficulties. The driller stopped the equipment, left the controls and walked to the rotary table. The left side of the rotary table was raised about 450 mm, but the right side, which should have been at the same level, was raised approximately 150 mm higher. The driller placed his head sideways under the rotary table in an attempt to determine the problem. The rotary table, which was not secured by safety chains, dislodged and fell onto the driller's head, causing fatal injuries.

YEAR: 1987 AGE: 25
OCCUPATION: Oil Field Maintenance Worker FILE: 0564
INDUSTRY: Steam Cleaning of Wells and Equipment
EXPERIENCE: 6 months

DESCRIPTION: Two oil field maintenance workers were involved in the flow testing of an oil well which had recently been completed. Every half hour, one worker would "mask up" and climb the 6.1 m vertical ladder on a 400 barrel tank in order to gauge the level of oil in the tank. The second worker stayed on the ground, obtained an oil sample from the well head and recorded the well tubing pressure. While gauging the tank, one of the workers fell off the ladder and died as a result of severe head injuries.

H_2S was escaping from the hatch while the gauging occurred and the ladder was slippery.

YEAR: 1987 AGE: 32
OCCUPATION: Derrickhand FILE: 0569
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 8 years

DESCRIPTION: A crew on an oil well drilling rig had reached the total contracted depth. To ensure the hole was clean in preparation for logging, it was necessary to pull ten stands of drill pipe. While pulling the eighth stand there was a loud noise and the top portion of the mast collapsed, striking and fatally injuring the derrickhand who was stationed on the fourble board.

YEAR: 1987 AGE: 53
OCCUPATION: Hot Oiler FILE: 0575
INDUSTRY: Hot Oil Treatment
EXPERIENCE: 30 years

DESCRIPTION: A "hot oil unit" was hired to dewax an oil well. The process involved the injection of preheated oil into the well to melt any wax build-up that was affecting well flow.

Just prior to the accident, the operator of the hot oil unit was experiencing difficulty in keeping the hot oil injection pump running because "light ends" from the heated oil were flashing off inside the pump, causing a vapor lock.

The operator cleared the vapor lock on two occasions prior to the accident by circulating the vapor out of the pump and into this holding tank. On the third attempt to circulate the vapor out of the pump, a large volume of vapor and a spray of hot oil escaped from the holding tank through an unsecured hatch. The vapor travelled across the truck deck and was ignited either by the magneto spark in the oil heater or the exhaust port on the unit. The resulting explosion and fire burned the operator and an oil company representative who was standing beside the truck. The operator died approximately 24 hours after the accident and the second worker recovered from burns to 30% of his upper body.

YEAR: 1987 AGE: 53
OCCUPATION: Lead Operator FILE: 0580
INDUSTRY: Cement and Chemical Treatment of Wells
EXPERIENCE: 33 years

DESCRIPTION: Three workers were using a winch truck to move a disabled oil field pumping truck from outside a maintenance shop into one of the service bays.

Because the disabled truck had suspected differential problems, the rear duals on both sides were being placed on planks to allow easier access to the differential. As the disabled truck was maneuvered into the shop, planks were placed in front of the rear wheels and then the truck was lifted and moved forward to be lowered onto the planks. The workers failed to notice that the top plank on the left side had been moved forward by the wheels and thus the left rear dual wheel was resting only on the rear edge of the top plank.

The winch truck was moved forward to allow one worker to disconnect the winch line from the disabled truck's bumper. Before the other worker was able to chock the disabled truck's wheels, the truck rolled off the planks and pinned the worker against the winch truck.

YEAR: 1987 AGE: 36
OCCUPATION: Apprentice Welder FILE: 0582
INDUSTRY: Mining and Processing of Bituminous Sand
EXPERIENCE: 5 years

DESCRIPTION: An apprentice welder was involved in the placement of tools and equipment necessary to commence welding on a length of pipe. After positioning the equipment, the worker requested assistance from a co-worker in establishing whether the electric welding machine was on. While attempting to establish why the welding machine was not functioning, he squatted down to inspect a connection between the welding machine and a heavy duty electrical extension cable. The electrical circuit was 600 volts, 3 phase. During the inspection of the electrical connection, the worker picked up the electrical cables, then stared blankly into space, and fell backwards. The worker died later of cardiac causes attributed to electrical shock.

YEAR: 1987 AGE: 21
OCCUPATION: Motorman FILE: 0586
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 2.5 years

DESCRIPTION: An oilwell drilling company had completed the directional drilling of a 1025 m deep well. As the drill string was being withdrawn from the bottom, approximately 13 m off the bottom, it became stuck. A procedure was initiated to jar the drilling string loose by impact.

As the procedure progressed, additional adjustment of the jarring mechanism was required and the procedure was interrupted. Two workers installed tongs to the drill pipe and an adjustment was attempted. The tongs failed to gain sufficient grip so they were removed. A worker remained on the rig floor to change the dies on the tongs to gain sufficient grip. This placed the worker on the floor of the rig below the crown and block assembly.

As the worker worked on the tongs, the procedure to free the drill string by jarring was continued. During this procedure the hook assembly separated from the block when the shank head fractured. The worker was fatally struck by the hook assembly after it hit the rig floor.

YEAR: 1987 AGE: 28
OCCUPATION: Derrickman FILE: 0591
INDUSTRY: Well Servicing with Service Rigs
EXPERIENCE: 5.5 years

DESCRIPTION: During a workover operation at an oil lease, a derrickman was fatally struck by the travelling block which fell after the hoist line separated. Work activity at the time of the accident was pulling of sucker rods. The derrickman was working at the rod basket level on the service rig.

YEAR: 1988 AGE: 26
OCCUPATION: Driller FILE: 0598
INDUSTRY: Drilling of Gas and Oil Wells
EXPERIENCE: 8 years

DESCRIPTION: An oil company received a conditional road approach approval allowing them to construct an access road under a power line to a proposed well site. A drilling company bid the project and subsequently hired a hauling company to move the rig on site.

A gin pole truck was used to move a radiator from a drawworks motor to a location on the southwest corner of the lease. A truck swamper and a driller steadied the elevated radiator as it was being moved. Driving onto the lease entrance road, the gin pole came into contact with a power line. The driller was electrocuted, the swamper received burns to his feet and has recovered.

YEAR: 1988 AGE: 31
OCCUPATION: Driller FILE: 0599
INDUSTRY: Seismic Operations
EXPERIENCE: 6 seasons

DESCRIPTION: A seismic company was involved in the drilling and loading (with explosives) of holes in a newly cleared seismic line.

Two workers operating a Gardner Denver seismic rig, drilled seven holes without any incident. Before drilling the eighth hole, the workers changed the hydraulic break-out unit on the rotary table and replaced it with a manual system referred to as the "J-bowl".

Following a short break, the two workers proceeded to stab a new stem into the kelly pin. It was at this time, that the driller got his right hand caught in the J-bowl assembly. The driller was tangled up in the drill stem and thrown 4.6 metres to his death.

YEAR: 1988 AGE: 23
OCCUPATION: Operator FILE: 0601
INDUSTRY: Natural Gas Processing Plants
EXPERIENCE: 7 years

OCCUPATION: Operator AGE: 31
INDUSTRY: Natural Gas Processing Plants
EXPERIENCE: 9 years

DESCRIPTION: At a sour gas processing facility, eight produced water (sour liquid) samples were to be taken from the inlet separator of the process system. These samples were in addition to the regular samples taken nearby at the process surge tank. A sample was taken the previous day without incident.
The following day, two operators, while preparing to obtain a sample, were overcome

during an H_2S release. The two operators later died and another worker attempting a rescue was also overcome by H_2S inhalation.

YEAR: 1988 AGE: 36
OCCUPATION: Auger Equipment Operator FILE: 0605
INDUSTRY: Horizontal or Angular Drilling
EXPERIENCE: 3 years

OCCUPATION: Labourer AGE: 20
INDUSTRY: Oilfield Maintenance and Construction
EXPERIENCE: 4 months

DESCRIPTION: Two pipeline workers were fatally injured when a truck mounted crane contacted an overhead power line. The two workers were part of a construction crew that was installing a pipeline in the oil patch. Contact with the overhead power line was made when the two workers were in process of lowering augering equipment into an excavation.

YEAR: 1988 AGE: 34
OCCUPATION: Operation Supervisor FILE: 0612
INDUSTRY: Oilfield Vacuum Cleaning Operations
EXPERIENCE: Several Years

DESCRIPTION: The incident occurred in a 25,000 litre low profile tanker trailer. Workers, at the time, were attempting to clear out the solids (sludge) on the tank bottom, which had accumulated over a period of time, during the hauling of benzene coke fines.

Approximately three and a half hours into the cleaning operation, an explosion and fire occurred inside the tank, fatally injuring one worker who was inside the tank at the time. At least four rescue attempts were made prior to the worker being retrieved from the tank.

YEAR: 1988 AGE: 28
OCCUPATION: Derrickman FILE: 0614
INDUSTRY: Well Servicing with Service Rigs
EXPERIENCE: 6 Years

DESCRIPTION: The derrickman on a service rig was fatally injured when he was struck by the travelling block which fell after the drilling line separated. The travelling block had been drawn up into the crown block at the top of the mast.

The injured worker who was positioned in the rod basket 4.8 m below the crown block, was lowered to the ground, but attempts to revive him were unsuccessful.

YEAR: 1988 AGE: 56
OCCUPATION: Derrickhand FILE: 0616
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 32 years

DESCRIPTION: Three workers were attempting to rotate the suction line to move the end of the line off the bottom of an open pit filled with fluids. While attempting to adjust this line, the rope the workers were pulling either broke or came unsecured. Two of the workers returned to the rig floor to resume other duties while the other worker attempted to re-secure the rope to the suction line. When one of the two workers returned to the area of the suction pit he was unable to find the other worker. After the worker's hard hat was found floating in the pit, the R.C.M.P., fire department, and ambulance were called and procedures were implemented to drain the pit. Once the pit was drained the firemen found the worker's body.

YEAR: 1988 AGE: 49
OCCUPATION: Rig Floor Operator FILE: 0619
INDUSTRY: Perforating and Logging Services
EXPERIENCE: 8 years

DESCRIPTION: A worker who was the rig floor operator on a crew of a service truck used for logging oil and gas wells was fatally injured.

Just prior to the accident, the worker was standing on the floor of the double stand drilling rig near the V-door guiding the logging tool as it was being hoisted. The top part of the logging tool (head) was drawn into the upper logging sheave positioned at the monkey board of the rig. This caused the hoisting line to separate, allowing the top section of logging tool to fall and strike the worker.

YEAR: 1988 AGE: 31
OCCUPATION: Oilfield worker FILE: 0620
INDUSTRY: Well Servicing with Service Rigs
EXPERIENCE: 14 years

DESCRIPTION: A service rig company had been hired by an oil company to "complete" a well. The service company believed the well to be "sweet". Prior to the accident, the producing formation had been acidized and two members of the crew had been requested to stay overnight and flow the well.

At approximately 01:00 after all the acid flush water had been returned to surface, oil began to flow. AT 02:30, after gauging the rig tank, one worker was overcome with H_2S. The second worker who was sleeping at the time of the first knockdown, awoke at 03:30 and found the first worker down. While attempting to rescue the first worker, the second worker was knocked down. Both workers were found on the ground the next morning, one had died, the other was unconscious but alive and has since recovered.

YEAR: 1988 AGE: 28
OCCUPATION: Battery Operator FILE: 0625
INDUSTRY: Operation of Gas or Oil Wells
EXPERIENCE: 6.5 months

DESCRIPTION: An oilfield battery operator was in the process of gauging a crude oil storage tank when the worker was killed by an explosion. The worker normally worked alone and was usually on the site during daylight hours.

On this occasion, the worker and a friend arrived at the battery after sunset and proceeded to do the required measurements. As the site was not illuminated, the worker had trouble reading the measuring tape and as a result used a cigarette lighter. The worker was killed instantly with the blast, and the friend died a day later from severe burns.

YEAR: 1989 AGE: 29
OCCUPATION: Motorman FILE: 0634
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 4 months

DESCRIPTION: A drilling crew was in the process of running production casing when the accident occurred. They were hoisting one length of 139.7mm x 13m casing from the V-door up into the derrick when the box end, which was secured in the elevators, snagged in the area of the rig's A-frame layover beam and the first derrick girt. The other end (pin end) of the casing pipe, which was still out in the catwalk area, continued to be raised up vertically until the driller realized what was taking place. He immediately stopped the hoisting movement and began to lower the pipe. The box end then freed itself causing the pin end to fall back to the catwalk striking the worker who was standing approximately one third the distance down the catwalk from the V-door end. He was knocked to the ground beneath the pipe rack suffering from fatal head injuries.

YEAR: 1989
OCCUPATION: Truck Driver
INDUSTRY: Shot Hole Drilling Operations
EXPERIENCE: 17 years
AGE: 37
FILE: 636

DESCRIPTION: A seismic drilling company's truck driver was fatally injured when the Nodwell all-terrain vehicle he was loading on to a low-boy slipped off the deck and pinned him under the capsized machine. The deceased was in the cab operating the Nodwell's steering controls with the door open while it was being winched on to the low-boy's deck by another truck driver. The deceased was either thrown from the Nodwell's cab on impact, or attempted to jump free, but was pinned by the top frame of the doorway across his back with his face down outside the unit.

YEAR: 1989
OCCUPATION: Floorhand
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 2 1/2 months
AGE: 18
FILE: 0645

DESCRIPTION: The workers involved in this incident were employed on a double stand drilling rig; they were completing a drill-stem and were coming out of the hole when the accident occurred. The deceased had been working in relief of fellow workers while they had a break. He had been located in the north east or break out side of the drilling rig floor, he was assisting another floor-hand to break-out (undo) the joints of pipe as they came out of the hole. The joint of pipe, immediately above the tongs, that they were working on, was broke (undone). The jaws on the end of the tongs were undone at the pipe and were pulled sharply by the break-out cathead line against the worker causing him to fall striking his head.

YEAR: 1989
OCCUPATION: Truck driver/owner
INDUSTRY: Oilfield Maintenance and Construction
EXPERIENCE: 25 years
AGE: 40
FILE: 0649

DESCRIPTION: Three workers had arrived at the well site with a truck unit on which they had erected a set of gin poles; also a second truck and trailer unit on which they were going to haul the pump jack assembly to another well site.

The driver of the gin pole truck backed it into position next to the pump jack base. The swamper and the second driver proceeded to rig up the slings and chain assembly to the winch-line in preparation for the gin pole to lift the pump jack.

The driver of the gin pole truck began to lift, and when the load lifted in an uneven manner, he set it down, and the hookup was relocated several times to get it balanced. When the load lifted evenly it was hoisted up to clear the securing bolts fastened to the base. Shortly after the pump jack had cleared the bolts, and not being secured at the top, the whole assembly tipped over away from the gin poles.

The second driver had remained in close proximity to the pump jack assembly while it was being lifted, and when the load tipped over he was struck and driven to the ground causing fatal injuries.

YEAR: 1990 AGE: 32
OCCUPATION: Rig Manager/Operator FILE: 0674
INDUSTRY: Well Servicing
EXPERIENCE: 8 years

DESCRIPTION: The operation involved a work-over service rig which was in the process of "fishing", which is the term used for retrieving equipment from down-hole. As part of the fishing process, piping and equipment were being placed into the hole. During this procedure a tool-joint (pipe and collar) got caught up on the hydraulic back-up tongs. This caused the weight of the piping and equipment in the hole to be transferred to the tong line and block. The tong block eye separated allowing the tong block to fall, striking one worker.

YEAR: 1990 AGE: 27
OCCUPATION: Driller FILE: 0680
INDUSTRY: Drilling
EXPERIENCE: 12 years

DESCRIPTION: The deceased and a fellow worker had climbed up onto the crown section of the derrick to disconnect the slings used to lift the derrick from a mobile crane. Neither worker were wearing any type of fall protection. The deceased then turned his attention to the boom pole which was in the stowed position lying on top of the derrick. The deceased was in the unfortunate position of standing in front of the support cable and was struck by the taut support cable at the ankles from behind as it uncoiled. The deceased was then thrown with considerable force into the air and then fell onto the crane cab, outrigger and finally to the ground.

YEAR: 1990 AGE: 26
OCCUPATION: Motorman FILE: 0690
INDUSTRY: Drilling
EXPERIENCE: 6 years

DESCRIPTION: A worker received fatal injuries as a result of being caught between two moving components while rigging up a drilling rig.

The deceased was a motorman who was engaged in the task of coupling the drawworks to the substructure of the drilling rig. It is speculated that under the mistaken impression that all movement had ceased between the drawworks and the substructure the deceased placed himself in a pinch point between the two components in order to secure the drawworks to the substructure by means of a turnbuckle. Movement of the drawworks had in fact not ceased and the drawworks were retracted off the substructure in attempts to clear whatever obstacle had prevented alignment. It is likely that at this point the deceased was sheared by the two components, sustaining fatal head injuries in the vicinity of the temples of the head. Subsequent motion of the drawworks released him from the pinch point and he slumped down on top of the blow out preventers upon which he was standing.

The deceased was discovered some minutes later in a semi sitting position on top of the blow out preventers by a co-workers.

YEAR: 1990 AGE: 48
OCCUPATION: Gas Plant Operator FILE: 0691
INDUSTRY: Drilling
EXPERIENCE: 15 years

OCCUPATION: Partner & Field Operations Manager AGE: 44
INDUSTRY: Drilling FILE: 0691
EXPERIENCE: 28 years

DESCRIPTION: An explosion and fire took place in a gas plant processing building causing fatal injuries to two workers. One worker died instantly and the second died a month later from the injuries he sustained.

YEAR: 1991 AGE: 61
OCCUPATION: Gas Plant Operator FILE: 0695
INDUSTRY: Natural Gas Processing Plant
EXPERIENCE: 30 years

DESCRIPTION: The gas plant operator was killed when struck by flying metal from piping and valves destroyed in an explosion. It is believed that the explosion occurred when very high pressure (6500 kpa) built up in the system, due to a hydrate ice plug and the improper procedures used to unblock the system. The high pressure, when released, caused the valve and related piping to explode.

YEAR: 1991 AGE: 28
OCCUPATION: Gas Plant Operator FILE: 0698
INDUSTRY: Operation of Gas or Oil Wells
EXPERIENCE: 10 years

DESCRIPTION: A worker entered a natural gas metering station whereupon he was asphyxiated as a result of an uncontrolled release of sweet natural gas therein. The worker was found dead on the floor, with gas rushing out of the building. The gas leak was due to a valve malfunction.

YEAR: 1991 AGE: 21
OCCUPATION: Quality Control Hand FILE: 0711
INDUSTRY: Cement and Chemical Treatment of Wells
EXPERIENCE: 15 months

DESCRIPTION: A worker assigned to open the bleed off valve was suited up to ensure that he would be protected from the noise and any acid that may escape during the bleed off process. As the worker moved the handle on the bleed off valve, an explosive uncontrolled release occurred that created a dust storm of acid, nitrogen and whipping iron. The worker was caught up in the whipping motion of the pipe and iron and was eventually thrown 20m away, where he came to rest. The injuries tot the worker were fatal.

YEAR: 1991 AGE: 31
OCCUPATION: Lease Hand FILE: 0712
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 11 years

DESCRIPTION: The worker was employed as a lease hand on a drilling rig. This rig is the type that utilizes a hydraulic pipe handling unit. At the time of the accident, the deceased worker entered a dangerous pinch point area to shut off a steam valve. The worker was crushed in the pinch point area of the pipe handler when it was activated.

YEAR: 1991 AGE: 49
OCCUPATION: Welder, Mechanic FILE: 0713
INDUSTRY: Vacuum Removal, Wet & Dry Waste
EXPERIENCE: N/A

DESCRIPTION: The incident took place when the welder was attempting to install a piece of lumber between the tank and the hydraulically operated rear door of the tank. He sustained fatal head injuries when the piece of lumber slipped out and the tank's rear door came down on his head.

YEAR:	1991	AGE:	37
OCCUPATION:	District Manager	FILE:	0717
INDUSTRY:	Operation of Gas or Oil Wells		
EXPERIENCE:	16 years		

DESCRIPTION: The worker was responsible to oversee well dyno testing and analysis operations conducted by a contract worker. The worker died while attempting to drain water from the lease.

APPENDIX B

Description of Industries

Industry Name	WCB Industry Code
Operation of oil and gas wells	6300
Gas Plants: Gas processing plant	6500
Processing sulphur	6501
Exploration: Seismic geo-physical exploration	9200
Shot hole drilling	9201
Drilling oil and gas wells	9600
Well servicing with service rigs	9903
Other oilfield services:	
Operation of battery tanks	6305
Vacuum removal of waste	6306
Mud logging	9900
Wireline and fish services	9901
Steam clean oilfield equipment	9902
Rathole drilling	9904
Operation of power swivels	9905
Compressed air/water service	9906
Hot oil treatment	9908
Perforating and logging services	9909
Power tong operations	9910
Cement/fracture/chemical treatment	9911
Well testing and coring	9912
Sump treatment and disposal	9913
Supply ammonium nitrate	9914
Well casing crews	9915
Levelling well drilling rig	9918
Installing blowout preventers	9919
Clean pipe thread at site	9920
Service christmas trees	9921
Transport drill stem by cable	9922
Shot hole cementing	9923
Recycle lube oil at drill site	9924
Pump water to drilling rigs	9926
Liquid waste disposal	9927
Oil and gas blowout control	9928
Monitor/control power tongs	9929

Industries Included Only in Alberta Totals

Oilfield maintenance and construction	6304
Tar Sands: Mining and processing tar sands	6600
Tar sand research	6601

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